

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Thomas S. Neal, et al

Serial No.: 10/800,281

Filed: March 12, 2004

For: Keyboard with a Switch-Membrane  
Assembly Circuit-Node Support  
Located in a Cavity

§ Confirmation No. 1299

§

§ Group Art Unit: 2629

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§ Examiner: Ma, Calvin

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§ Atty Docket: 200314054-1

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/Nathan E. Stacy/

Nathan E. Stacy

**APPEAL BRIEF PURSUANT  
TO 37 C.F.R. §§ 41.31 AND 41.37**

This Appeal Brief is being filed in response to the Final Office Action mailed on May 7, 2009, and in furtherance of a Notice of Appeal filed July 7, 2009.

1. **REAL PARTY IN INTEREST**

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 11445 Compaq Center Drive W., Houston, TX 77070, U.S.A. (hereinafter “HPDC”). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

2. **RELATED APPEALS AND INTERFERENCES**

The Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellants’ legal representative in this Appeal.

3. **STATUS OF CLAIMS**

Claims 1-26 are currently pending, are currently under rejection and, thus, are the subject of this appeal.

4. **STATUS OF AMENDMENTS**

There are no outstanding amendments to be considered by the Board.

5. **SUMMARY OF CLAIMED SUBJECT MATTER**

The Application contains 5 independent claims, namely, claims 1, 15, 19, 20 and 24, all of which are the subject of this Appeal. With regard to independent claim 1, discussions of the recited features can be found at least in the below-cited locations of the specification and drawings. By way of example, claim 1 recites a keyboard enclosure (e.g., 52, 64) for a keyboard (e.g., 50) comprising a first cavity, in which a circuit (e.g., 60) can be disposed. *See id.* at p. 3, ll. 23-24; Fig. 2. The circuit includes a first node (e.g., 74) and a second node (e.g., 56) both of which correspond to a key (e.g., 62). *See id.* at p. 4, ll. 22-24; Fig. 2. The circuit is operable to generate a signal when the key causes the first and second nodes to contact each other. *See id.* at p. 4, ll. 18-24; Fig. 2.

The keyboard enclosure also includes a region forming a second cavity (e.g., 58) in a lower enclosure (e.g., 52) for stiffening the lower enclosure and for providing a passage for one or more cables (e.g., 23) that electrically connect the keyboard to a processor (e.g., 114). *See id.* at p. 1, ll. 23-26; Fig. 1. The keyboard enclosure also includes a node support (e.g., 54) located in the second cavity and operable to provide physical support for the second node of the circuit to ensure contact between the first and second nodes is maintained when the circuit disposed in the first cavity generates the signal. *See id.* at p. 3, l. 23 – p. 4, l. 3; p. 4, ll. 24-27; Fig. 2-4.

With regard to independent claim 15, discussions of the recited features can be found at least in the below-cited locations of the specification and drawings. By way of example, claim 15 recites a keyboard (e.g., 50) comprising a plurality of keys (e.g., 62), each movable relative to the other keys. *See id.* at p. 4, ll. 4-7; Fig. 2. The keyboard also comprises a switch membrane assembly (e.g., 68) including a plurality of circuits (e.g., 60) each having a first node (e.g., 74) and a second node (e.g., 56) both of which correspond to a respective one of the keys. *See id.* at p. 4, ll. 7-12; Fig. 2. Each circuit is operable to generate a signal when the key corresponding to the circuit's first and second nodes cause the first and second nodes to contact each other. *See id.* at p. 4, ll. 18-24; Fig. 2. The keyboard also comprises an upper enclosure (e.g., 64) to hold the keys and a lower enclosure (e.g., 52) to support the switch membrane assembly. *See id.* at p. 4, ll. 4-7; Fig. 2. The lower enclosure includes a region forming a cavity (e.g., 58) for stiffening the lower enclosure and for providing a passage for one or more cables (e.g., 23) that electrically connect the keyboard to a processor (e.g., 114). *See id.* at p. 5, ll. 3-6; Fig. 2, 3. The lower enclosure also includes a node support (e.g., 54) located in the cavity and operable to provide physical support for one or more of the nodes of the switch membrane assembly to ensure contact between the first and second nodes is maintained when the circuit generates the signal. *See id.* at p. 3, l. 23 – p. 4, l. 3; p. 4, ll. 24-27; Fig. 2-4.

With regard to independent claim 19, discussions of the recited features can be found at least in the below-cited locations of the specification and drawings. By way of example, claim 19 recites a computer system (e.g., 110) comprising computer circuitry (e.g., 112) for performing computer functions. *See id.* at p. 7, ll. 22-25; Fig. 5. The computer system also comprises a keyboard (e.g., 50) operable to provide data to the circuitry. *See id.* at p. 7, ll. 25-27; Fig. 5. The keyboard includes a plurality of keys (e.g., 62), each movable relative to the other keys. *See id.* at p. 4, ll. 4-7; Fig. 2. The keyboard also includes a switch membrane assembly (e.g., 68) including a plurality of circuits each having a first node (e.g., 74) and a second node (e.g., 56) both of which correspond to a respective one of the keys. *See id.* at p. 4, ll. 7-12; Fig. 2. Each circuit is operable to generate a signal when the key corresponding to the circuit's first and second nodes causes the first and second nodes to contact each other. *See id.* at p. 4, ll. 18-24; Fig. 2. The keyboard also includes an upper enclosure (e.g., 64) to hold the keys, and a lower enclosure (e.g., 52) to support the switch membrane assembly. *See id.* at p. 4, ll. 4-7; Fig. 2. The lower enclosure includes a region forming a cavity (e.g., 58) for stiffening the lower enclosure and providing a passage for one or more cables (e.g., 23) that electrically connect the keyboard to a processor (e.g., 114). *See id.* at p. 5, ll. 3-6; Fig. 2, 3. The lower enclosure also includes a node support (e.g., 54) located in the cavity and operable to provide physical support for one or more of the nodes of the switch membrane assembly to ensure contact between the first and second nodes is maintained when the circuit generates the signal. *See id.* at p. 3, l. 23 – p. 4, l. 3; p. 4, ll. 24-27; Fig. 2-4.

With regard to independent claim 20, discussions of the recited features can be found at least in the below-cited locations of the specification and drawings. By way of example, claim 20 recites a method for supporting a switch membrane assembly (e.g., 68) of a keyboard (e.g., 50), comprising forming a first cavity in an enclosure of a keyboard and in which a circuit (e.g., 60) can be disposed. *See id.* at p. 3, ll. 23-24; Fig. 2. The circuit includes a first node (e.g., 74) and a second node (e.g., 56) both of which correspond to a key (e.g., 62). *See id.* at p. 4, ll. 22-24; Fig. 2. The circuit is operable to generate a signal when the key causes the first and second nodes to contact each other.

*See id.* at p. 4, ll. 18-24; Fig. 2. The method also includes forming a second cavity (e.g., 58) in a region of a lower enclosure (e.g., 52) for stiffening the lower enclosure and for providing a passage for one or more cables (e.g., 23) that electrically connect the keyboard to a processor (e.g., 114). *See id.* at p. 1, ll. 23-26; Fig. 1. The method also includes locating a node support (e.g., 54) in the second cavity to provide physical support for the second node to ensure contact between the first and second nodes is maintained when the circuit generates the signal. *See id.* at p. 3, l. 23 – p. 4, l. 3; p. 4, ll. 24-27; Fig. 2-4.

With regard to independent claim 24, discussions of the recited features can be found at least in the below-cited locations of the specification and drawings. By way of example, claim 24 recites a method for generating a signal, the method comprising moving a key (e.g., 62) of a keyboard (e.g., 50) to move a top node (e.g., 74) of a switch membrane assembly (e.g., 68) toward a corresponding bottom node (e.g., 56) of the assembly. *See id.* at p. 4, ll. 18-24; Fig. 2. The top and bottom nodes are disposed in a first cavity of the keyboard. *See id.* at Fig. 2. The method also includes contacting the bottom node with the top node support to generate a signal. *See id.* at p. 4, ll. 18-24; Fig. 2. The method also includes physically supporting the bottom node with a node support (e.g., 54) when the top node contacts the bottom node to ensure contact between the top and bottom nodes is maintained when the signal is generated. *See id.* at p. 3, l. 23 – p. 4, l. 3; p. 4, ll. 24-27; Fig. 2-4. The node support is located in a second cavity (e.g., 58) of the keyboard. *See id.* at p. 3, ll. 23-24; Fig. 1. The second cavity is located in a lower enclosure (e.g., 52) for stiffening the lower enclosure and for providing a passage for one or more cables (e.g., 23) that electrically connect the keyboard to a processor (e.g., 114). *See id.* at p. 1, ll. 23-26; Fig. 1.

6. **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

**A. First Ground of Rejection for Review on Appeal**

The Appellants respectfully urge the Board to review and reverse the Examiner's first ground of rejection in which the Examiner rejected claims 1-3, 6-15, 19, 20 and 24-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,965,076 to Wu (hereinafter "Wu") in view of U.S. Patent No. 5,615,081 to Ma (hereinafter "Ma").

**B. Second Ground of Rejection for Review on Appeal**

The Appellants respectfully urge the Board to review and reverse the Examiner's second ground of rejection in which the Examiner rejected claims 16,18, 21-23 under 35 U.S.C. § 103(a) as being unpatentable over Wu and Ma, as applied to claims 1 and 15, and further in view of U.S. Patent No. 5,865,546 to Ganthier, et al. (hereinafter "Ganthier").

**C. Third Ground of Rejection for Review on Appeal**

The Appellants respectfully urge the Board to review and reverse the Examiner's third ground of rejection in which the Examiner rejected claims 4 and 5 under 35 U.S.C. § 103(a) as being unpatentable over Wu and Ma, as applied to claims 1-3, and further in view of Sheehan ([http://reviews.cnet.com/keyboards/apple-wireless-keyboard/4505-3134\\_7-30568482.html?tag=prod.img.1](http://reviews.cnet.com/keyboards/apple-wireless-keyboard/4505-3134_7-30568482.html?tag=prod.img.1)) (hereinafter "Sheehan").

**D. Fourth Ground of Rejection for Review on Appeal**

The Appellants respectfully urge the Board to review and reverse the Examiner's fourth ground of rejection in which the Examiner rejected claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Wu and Ma, as applied to claims 1 and 15, and further in view of U.S. Patent No. 6,587,094 to Anderson (hereinafter "Anderson").

7. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. Further, the Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under 35 U.S.C. § 103(a). Accordingly, the Appellants respectfully request full and favorable consideration by the Board, as the Appellants assert that claims 1-26 are currently in condition for allowance.

As a preliminary matter, it is noted that the Examiner appears to have cited Ma in several instances when the Examiner was actually referring to Ganthier. For example, although the Examiner originally stated that independent claim 20 is rejected over Wu in view of Ma, the Examiner actually rejected claim 20 over Wu in view of Ganthier. *See* Final Office Action, pp. 2, 8. Further, in rejecting claims 15 and 19, the Examiner cites Ma while referring to element numbers that are consistent with Ganthier rather than Ma. Accordingly, the Appellants have discussed Ganthier along with Wu and Ma under the First Ground of Rejection, below.

**A. First Ground of Rejection**

The Appellants respectfully traverse the Examiner's rejection of claims 1-3, 6-15, 19-20, and 24-26 under 35 U.S.C. § 103(a), as being unpatentable over Wu in view of Ma. The burden of establishing a prima facie case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (B.P.A.I. 1979). To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Although a showing of obviousness under 35 U.S.C. § 103 does not require an express teaching, suggestion or motivation to combine prior art references, such a showing has been described by the Federal Circuit as providing a "helpful insight" into the obviousness inquiry. *KSR Int'l. Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 U.S.P.Q.2d 1385 (2007). Moreover, obviousness cannot be established by a mere showing that each claimed element is present in the prior art. *Id.* The Examiner must cite a compelling reason why

a person having ordinary skill in the art would combine known elements in order to support a proper rejection under 35 U.S.C. § 103. *Id.*

As generally discussed above, the present claims are directed to a keyboard assembly with a node support for physically supporting a node of a circuit to ensure that an electrical connection is completed when a key of the keyboard is pressed. *See* Specification, p. 3, l. 23 – p. 4, l. 3; p. 4, ll. 24-27; Fig. 2-4. Unlike the metal plate provided in conventional keyboards, embodiments of the node supports described in the present specification project up from the lower enclosure of the keyboard and support each node individually. *See id.* at p. 3, ll. 23-24; p. 5, l. 29 – p. 6, l. 8; Figs. 2-4. The node supports take the place of the metal plate that is typically included in most keyboards, thus making the keyboard less expensive to manufacture. *See id.* at p. 2, ll. 22-28; p. 3, ll. 2-7.

Accordingly, independent claims 1, 15, and 19 generally recite, *inter alia*, “a node support ... operable to provide physical support ... to ensure contact between the first and second nodes is maintained when the circuit ... generates the signal.” Additionally, independent claim 20 recites, *inter alia*, “locating a node support in the second cavity to provide physical support for the second node to ensure contact between the first and second nodes is maintained when the circuit generates the signal.” Furthermore, independent claim 24 recites, *inter alia*, “physically supporting the bottom node with a node support when the top node contacts the bottom node to ensure contact between the top and bottom nodes is maintained when the signal is generated.”

By contrast, Wu discloses a modular keyboard assembly that facilitates “the production of a new modular keyboard with removable, replaceable, swappable, interchangeable and user-serviceable modules.” Wu, col. 3, ll. 55-57. Nowhere does Wu disclose the use of node supports as defined in the present specification and recited in the present claims. In fact, Fig. 1a of Wu shows a “bottom holding plate,” which is described in Wu as being “used to hold the previous components [i.e., circuit membrane, key



actuating mechanism, etc.] in place.” *Id.*, Fig. 1a; col. 3, ll. 17-18. Furthermore, several figures in Wu also show a metal plate below the circuit membrane. *Id.*, Figs. 2a, 2b, 2d. Thus, with regards to supporting a bottom node of a circuit, Wu merely discloses the typical keyboard design discussed in the background of the present specification. Thus, Wu does not disclose a “node support” as defined in the present specification and recited in the present claims.

Furthermore, Ma does not remedy the deficiencies of Wu, alone or in any hypothetical combination with Ma. Ma discloses a portable computer that includes “two sub-keyboards which are turnably opened or closed so as to increase the overall size of the keyboard.” Ma, col. 1, ll. 49-52. Ma describes the sub-keyboards as consisting of “a keyboard surface 31 provided with a plurality of keys thereon.” *Id.*, col. 2, ll. 40-42. Although, Ma provides additional details regarding techniques for attaching the sub-keyboards to the portable computer, Ma does not disclose any details regarding the construction of the keyboards themselves. Thus Ma does not disclose a “node support,” as defined by the present specification and recited in the present claims.

Additionally, Ganthier also does not remedy the deficiencies of Wu or Ma, alone or in any hypothetical combinations. Ganthier discloses a “modular keyboard that can be easily and quickly configured to suit the needs of a user.” Ganthier, col. 1, ll. 18-20. The keyboard disclosed in Ganthier, includes “a keyboard shell ... and a plurality of input device modules,” one of which may be a “keyboard module.” *Id.*, col. 3, ll. 41-47. The keyboard module is described in Ganthier as being “a standard keyboard, a Microsoft Windows 95® keyboard, or a European-style (EuroAPD) keyboard.” *Id.*, col. 3, ll. 55-59. However, no further details are provided regarding the internal features of the keyboard module. Thus, Ganthier does not disclose a “node support,” as defined by the present specification and recited in the present claims.

In rejecting independent claim 1, the Examiner apparently equated the node support of the present claims with the “electrical circuitry membrane located in the lower

enclosure” disclosed in Wu. Final Office Action, p. 3. However, the electrical circuitry membrane of Wu is *not* the same as a *node support* as defined in the present specification and recited in the present claims. Rather, the electrical circuitry membrane of Wu is the substrate in which the circuit node is formed. As described in the present specification, a node support is a feature that *physically supports* the circuit node to prevent the bottom node from moving when the top node is pressed into contact with the bottom node. Without the node support, the bottom node may move because the membrane on which the bottom node is disposed is flexible. In other words, the node support is a structure that prevents the membrane from flexing, therefore, the node support cannot itself be the membrane. Thus, the electrical circuitry membrane of Wu is not the same as a node support as defined in the present specification and recited in claim 1.

In fact, the Examiner appears to concede this point in the rejection of claim 15. Unlike claim 1, claim 15 recites a “switch membrane assembly.” Although the Appellants do not concede the correctness of the Examiners assertions with regard to claim 15, it is important to note that the Examiner apparently did not equate the electrical circuitry membrane of Wu with the node support of claim 15, as was done in claim 1. Rather, in claim 15, the Examiner apparently equated the electrical circuitry membrane of Wu with the “switch membrane assembly.” Thus, the Appellants respectfully assert that even the Examiner has conceded that the electrical circuitry membrane of Wu is not equivalent to a node support as defined in the present specification and recited in claim 1.

Furthermore, in rejecting independent claims 15, 19, and 20 the Examiner equated the node support of the present claims with the female connector slot of Ganthier. Final Office Action, p. 8. (As discussed above in the second paragraph of the Argument section, the Examiner appears to have mistakenly cited Ma for the rejection of claims 15 and 19 when, in fact, the item numbers referred to by the Examiner are consistent with Ganthier and are not present in Ma.) The female connector slot is described in Ganthier as “providing an electrical path for the signals between the input device modules ... and the keyboard shell.” See Ganthier, col. 5, ll. 37-44; Fig. 1. The female connector slot is

not described as physically supporting a circuit node. Moreover, the female connector slot is not even located inside the keyboard module where the circuit node would hypothetically be located. Thus, the female connector slot is *not* the same as a node support as defined in the present specification and recited in claims 15 and 19.

In rejecting independent claim 24, the Examiner did not cite any element from the references that could even hypothetically be considered equivalent to a node support. Final Office Action, p. 9. With regard to the method element of “physically supporting the bottom node,” the Examiner made reference to an “electrical contact circuit” but did not provide a specific element number. In any case, an electrical contact circuit as disclosed in either Ma or Ganthier is not the same as a node support, which is described in the present specification as a structure that physically supports a circuit node to prevent the node from moving when pressed on. Thus, the electrical contact circuit is not the same as a node support as defined in the present specification and recited in claim 24.

For at least the reasons discussed above, none of the cited references, alone or in any hypothetical combination, discloses all of the elements recited in independent claims 1, 15, 19, 20 and 24. Accordingly, these claims are allowable over Wu, Ma, and Ganthier. Dependent claims 2-3, 6-14, and 24-26 are also allowable over the cited references at least for the reasons stated above. Accordingly, the Appellants respectfully request the Board to reverse the rejection of claims 1-3, 6-15, 19-20, and 24-26 under 35 U.S.C. § 103.

#### **B. Second Ground of Rejection**

The Appellants respectfully traverse the Examiner’s rejection of claims 16, 18, and 21-23 under 35 U.S.C. § 103(a), as being unpatentable over Wu and Ma and further in view of Ganthier.

Claims 16 and 18 ultimately depend from independent claim 15. Claims 21-23 ultimately depend from independent claim 20. As discussed above, Wu, Ma, and

Ganthier, either alone or in any hypothetical combination, fail to disclose all of the elements of independent claims 15 and 20. Accordingly, claims 16, 18, and 21-23 are allowable over Wu, Ma, and Ganthier for at least the same reasons as discussed with respect to the first ground of rejection.

The Appellants therefore respectfully assert that Wu, Ma, and Ganthier, whether alone or in any sort of hypothetical combination, fail to disclose all of the elements of claims 16, 18, and 21-23. Therefore, the Appellants respectfully request the Board to reverse the rejection of claims 16, 18, and 21-23 under 35 U.S.C. § 103(a).

### **C. Third Ground of Rejection**

The Appellants respectfully traverse the Examiner's rejection of claims 4 and 5 under 35 U.S.C. § 103(a), as being unpatentable over Wu in view of Ma and further in view of Sheehan. Claims 4 and 5 ultimately depend from independent claim 1. As discussed above, Wu, and Ma, either alone or in any hypothetical combination, fail to disclose all of the elements of independent claims 1. Accordingly, claims 4 and 5 are allowable over Wu and Ma for at least the same reasons as discussed with respect to the first ground of rejection.

Furthermore, Sheehan does not remedy the deficiencies of Wu and Ma. Sheehan is an online review of a wireless keyboard and does not disclose a node support or any of the internal structure of the keyboard. *See*, Sheehan. Indeed, the Examiner has cited Sheehan for merely disclosing the external dimensions of the keyboard. *See* Final Office Action, p. 13.

For at least these reasons, the Appellants respectfully assert that Wu, Ma, and Sheehan, whether alone or in any sort of hypothetical combination, fail to disclose all of the elements of claims 4 and 5. Therefore, the Appellants respectfully request the Board to reverse the rejection of claims 4 and 5 under 35 U.S.C. § 103(a).

**D. Fourth Ground of Rejection**

The Appellants respectfully traverse the Examiner's rejection of claim 17 under 35 U.S.C. § 103(a), as being unpatentable over Wu in view of Ma and further in view Anderson. Claim 17 ultimately depends from independent claim 15. As discussed above, Wu, and Ma, either alone or in any hypothetical combination, fail to disclose all of the elements of independent claims 15. Accordingly, the Appellants assert that claim 15 is allowable over Wu and Ma for at least the same reasons as discussed with respect to the first ground of rejection.

Furthermore, Anderson does not remedy the deficiencies of Wu and Ma, alone or in any hypothetical combinations. Anderson discloses a two-sided input device in which "a generally planar module of the device has two sets of input controls mounted to opposite planar surfaces of the module." Anderson, col. 2, ll. 49-51. With regard to the internal structure of the module, Anderson states that the "[m]odule is preferably formed of relatively thin keyboard subassemblies, such as those frequently found on laptop computers." *Id.*, col. 4, ll. 37-39. Thus, Anderson merely discloses conventional keyboard structures and does not remedy the deficiencies of Wu and Ma. Indeed, the Examiner has cited Anderson for merely disclosing a keyboard with two legs to support the keyboard enclosure above a surface. *See* Final Office Action, p. 14.

For at least these reasons, the Appellants respectfully assert that Wu, Ma, and Anderson, whether alone or in any sort of hypothetical combination, fail to disclose all of the elements of claim 17. Therefore, the Appellants respectfully request the Board to reverse the rejection of claim 17 under 35 U.S.C. § 103(a).

**F. Request for Reversal of the Rejections**

In view of the reasons set forth above, the Appellants respectfully request the Board to reverse all of the rejections of claims 1-26 under 35 U.S.C. § 103(a).

**Conclusion**

The Appellants respectfully submit that all pending claims are in condition for allowance. However, if the Examiner or Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: September 3, 2009

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8. **APPENDIX OF CLAIMS ON APPEAL**

**Listing of Claims:**

1. A keyboard enclosure for a keyboard comprising:  
a first cavity in which a circuit can be disposed, the circuit including a first node and a second node both of which correspond to a key, wherein the circuit is operable to generate a signal when the key causes the first and second nodes to contact each other;  
a region forming a second cavity in a lower enclosure for stiffening the lower enclosure and for providing a passage for one or more cables that electrically connect the keyboard to a processor; and  
a node support located in the second cavity and operable to provide physical support for the second node of the circuit to ensure contact between the first and second nodes is maintained when the circuit disposed in the first cavity generates the signal.
2. The enclosure of claim 1 wherein the enclosure includes a single second cavity.
3. The enclosure of claim 1 wherein the second cavity has a substantial U-shape.
4. The enclosure of claim 1 wherein the second cavity has a substantial U-shape and extends substantially 15.5 inches.
5. The enclosure of claim 1 wherein the second cavity has a substantial U-shape, extends substantially 15.5 inches, and is substantially 0.5 inches deep.

6. The enclosure of claim 1 wherein the enclosure includes thirteen node supports, each disposed in the second cavity.
7. The enclosure of claim 1 wherein the node support has a cylindrical shape.
8. The enclosure of claim 7 wherein the node support is hollow.
9. The enclosure of claim 1 wherein the second cavity has a substantial U-shape and a bottom wall, and the node support extends from the bottom wall.
10. The enclosure of claim 1 wherein the node support includes an end located at an entrance of the second cavity.
11. The enclosure of claim 1 wherein the enclosure includes a floor and a rib to maintain the position of the node support relative to the floor.
12. The enclosure of claim 11 wherein the enclosure includes at least two ribs each operable to maintain the position of the node support relative to the floor.
13. The enclosure of claim 12 wherein the enclosure includes at least two node supports, and one of the ribs extends between two node supports.
14. The enclosure of claim 11 wherein:  
the second cavity has a substantial U-shape, a bottom wall, and a sidewall,  
the node support extends from the bottom wall, and  
the enclosure includes at least two ribs that extend between the node support and  
at least one side wall.
15. A keyboard comprising:  
a plurality of keys, each movable relative to the other keys;



a switch membrane assembly including a plurality of circuits each having a first node and a second node both of which correspond to a respective one of the keys, wherein each circuit is operable to generate a signal when the key corresponding to the circuit's first and second nodes cause the first and second nodes to contact each other;

an upper enclosure to hold the keys; and

a lower enclosure to support the switch membrane assembly, the lower enclosure including:

a region forming a cavity for stiffening the lower enclosure and for providing a passage for one or more cables that electrically connect the keyboard to a processor, and

a node support located in the cavity and operable to provide physical support for one or more of the nodes of the switch membrane assembly to ensure contact between the first and second nodes is maintained when the circuit generates the signal.

16. The keyboard of claim 15 wherein the lower enclosure includes thirteen node supports, each operable to support a respective one of the nodes of the switch membrane assembly.

17. The keyboard of claim 15 wherein: the lower enclosure includes two legs operable to support a portion of the lower enclosure above a surface, and the region extends between the two legs.

18. The keyboard of claim 15 wherein the lower enclosure includes a rib operable to maintain the position of the node support relative to the one or more nodes of the switch membrane assembly.

19. A computer system comprising:

computer circuitry for performing computer functions; and

a keyboard operable to provide data to the circuitry and including:  
a plurality of keys, each movable relative to the other keys,  
a switch membrane assembly including a plurality of circuits each having a first node and a second node both of which correspond to a respective one of the keys, wherein each circuit is operable to generate a signal when the key corresponding to the circuit's first and second nodes causes the first and second nodes to contact each other,  
an upper enclosure to hold the keys, and  
a lower enclosure to support the switch membrane assembly, the lower enclosure including:  
a region forming a cavity for stiffening the lower enclosure and providing a passage for one or more cables that electrically connect the keyboard to a processor, and  
a node support located in the cavity and operable to provide physical support for one or more of the nodes of the switch membrane assembly to ensure contact between the first and second nodes is maintained when the circuit generates the signal.

20. A method for supporting a switch membrane assembly of a keyboard, comprising:
- forming a first cavity in an enclosure of a keyboard and in which a circuit can be disposed, the circuit including a first node and a second node both of which correspond to a key, wherein the circuit is operable to generate a signal when the key causes the first and second nodes to contact each other;
  - forming a second cavity in a region of a lower enclosure for stiffening the lower enclosure and for providing a passage for one or more cables that electrically connect the keyboard to a processor;

locating a node support in the second cavity to provide physical support for the second node to ensure contact between the first and second nodes is maintained when the circuit generates the signal.

21. The method of claim 20 further comprising locating a rib in the second cavity to maintain the position of the node support relative to a floor of the enclosure.

22. The method of claim 21 wherein locating the rib includes extending the rib between the node support and a wall of the second cavity.

23. The method of claim 21 wherein locating the rib includes extending the rib between two node supports.

24. A method for generating a signal, the method comprising:  
moving a key of a keyboard to move a top node of a switch membrane assembly toward a corresponding bottom node of the assembly, wherein the top and bottom nodes are disposed in a first cavity of the keyboard;  
contacting the bottom node with the top node support to generate a signal; and  
physically supporting the bottom node with a node support when the top node contacts the bottom node to ensure contact between the top and bottom nodes is maintained when the signal is generated, wherein the node support is located in a second cavity of the keyboard, wherein the second cavity is located in a lower enclosure for stiffening the lower enclosure and for providing a passage for one or more cables that electrically connect the keyboard to a processor.

25. The method of claim 24 wherein moving the key of the keyboard includes pushing the key toward the top node.

26. The enclosure of claim 1, wherein the node support eliminates a need for a metal plate to provide the keyboard a desired stiffness during use.

9. **EVIDENCE APPENDIX**

None.

10. **RELATED PROCEEDINGS APPENDIX**

None.